

REMARKS

Reconsideration and allowance of the present application are respectfully requested. Claims 1-12 remain pending in the application. New claim 16 has been added. Claims 13-15 have been withdrawn from consideration following a Restriction Requirement.

On page 2 of the Office Action, the Examiner has requested that the status of the application on specification page 1 be updated. By the foregoing amendment, the update requested by the Examiner has been submitted. The continuation-in-part of copending application Serial No. 09/244,630, filed February 4, 1999 has been abandoned in favor of the above-identified application.

On page 3 of the Office Action, claims 1-12 are rejected under 35 U.S.C. §112, second paragraph. All of the objections by the Examiner in this portion of the Office Action have been addressed by the foregoing amendments.

With regard to Claim 1, the Examiner asserts that the claim 1 feature of "immediately feeding said pellets without intermediate storage" is indefinite "because the piece of machinery or step from which the pellets are being transferred 'to and from' is not clearly set forth." This objection is respectfully traversed. Claim 1 has been amended to address the Examiner's concerns. In addition, Applicants submit that the original phrase objected to by the Examiner is clearly directed to the feeding of "pellets", and these pellets are clearly and unambiguously produced in the claim 1 cutting step. Note that the cutting step refers to the conversion of "elongated strands" into "pellets". These pellets, once produced, are then fed by the "feeding" step. The "crystallizing" step refers to crystallizing the pellets "as they are fed in said feeding step from said cutting step". Thus, claim 1 is clear and unambiguous. In

light of the foregoing, withdrawal of the objections to claims 1-12 is respectfully requested.

In the last paragraph on page 5 of the Office Action, claims 1-9 and 12 are rejected under 35 U.S.C. §103(a) as being patentable over U.S. Patent No. 5,876,644 (Nichols et al) in view of U.S. Patent No. 5,587,186 (Voigt) and U.S. Patent No. 5,119,570 (Russemeyer et al). Although the Examiner has noted, with appreciation, that claims 10 and 11 contain allowable subject matter, claim 1 is considered to afford Applicants a scope of protection to which they are entitled in light of the prior art.

Applicants' disclosure describes a process for upgrading non-virgin plastic material to be reclaimed. Referring to Figure 1, PET is produced in an extrusion step 1 after which the material is precrystallized in step 2. A main crystallizing step 3 is then performed, followed by polycondensation in step 4. Formed bottles are sold in step 5, after which they are either discarded (step 6) or reclaimed (step 7). For reclaiming, a collection system is used which includes a drying step 11 and a melting and extrusion step 12. After a filtering step 13, extruded strands are cut to pieces or pellets in step 14, and fed through crystallizing step 3.

Referring to Figure 2, steps 2-4 and 14 are illustrated in greater detail. In Figure 2, pellets from cutting step 14 are fed into a fluidized bed 3' of the crystallizing step 3. An inert gas, such as nitrogen from a source 15, can be associated with the crystallizing step 3. Thus, pellets which have been cut in step 14 of Figure 1 are immediately fed to the fluidized bed 3' of the crystallized step 3 via a rotary valve 3c without immediate storage. Following crystallization using, for example, a stream of high gas, such as nitrogen, the pellets are immediately fed from the crystallizing step

3 to a condensing step 4 without intermediate storage using, for example, a rotary valve 23 and a heater/reactor 4' (see last paragraph, specification page 10). In the reactor 4', the pellets are heated to provoke condensation of the material.

Exemplary embodiments of the present invention provide significant advantages. For example, exemplary embodiments can provide a higher yield by reclaiming larger quantities of non-virgin, used plastic material. In addition, investment costs and expenses of operation can be avoided by eliminating intermediate storage, at the same time, better quality of reclaimed plastic material can be provided.

Exemplary embodiments also provide advantages including, but not limited to, reduced energy loss and reduced space requirements between crystallization and condensing. In addition, a portion of the crystallization in processed material can occur after pellets have left the crystallizer in a crystallizing step. As such, additional crystallization heat (latent heat of solidification) can be available during post-condensation and compensate for heat losses, thus reducing the required energy input of the process.

Exemplary embodiments achieve the foregoing and other advantages, at least in part, by using continuous treatment steps throughout the reclamation process, whereby pellets are continuously crystallized as they are fed after cutting and, through continuous feeding, subjected to solid state condensing.

The foregoing features are broadly encompassed by Applicants' claim 1 process which includes, among other features, continuously extruding the plastic material to provide elongated strands thereof, continuously cutting the elongated strands as they are supplied by the extrusion step to convert them into pellets which

are immediately fed, without intermediate storage, for continuous crystallization in a stream of high gas. The pellets are then immediately fed from a crystallizer following the continuous crystallizing for solid state condensing without intermediate storage.

The foregoing features are neither taught nor suggested by the Nichols patent, considered individually or in combination with the Voigt and/or Russemeyer patents. The Nichols patent is directed to recycling polyester. The Figure 1 embodiment of Nichols discloses a heating device 15 for melting polyester pieces 12, which are then extruded in a melt phase using extruders 16. The melt can also be filtered using, for example, a screen filter 17 before or after extrusion. Nichols does not teach or suggest cutting strands and crystallizing extruded polyester. Moreover, Nichols does not teach or suggest immediately feeding cut pellets from a crystallizer to a condenser without intermediate storage.

The Voigt and Russemeyer patents fail to overcome the deficiencies of the Nichols patent. The Examiner acknowledges on page 6 of the Office Action that Nichols "does not teach forming pellets by cutting elongated strands." The Examiner further acknowledges on this page of the Office Action that Nichols "does not teach continuous crystallization in a stream of hot nitrogen gas at a crystallization temperature". The Examiner therefore relies on the Voight and Russemeyer patents. However, none of these patents, considered individually or in combination, teach or suggest the continuous processing of Applicants' claim 1 wherein, among other features, intermediate storage is avoided.

Thus, claim 1 is considered allowable. All of the remaining claims depend from claim 1 and recite additional advantageous features which further distinguish over the documents relied upon by the Examiner.

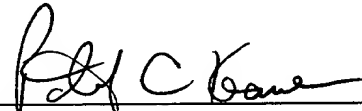
All objections and rejections raised in the Office Action having been addressed, it is respectfully submitted that the application is in condition for allowance and a Notice of Allowance is respectfully solicited.

Respectfully submitted,

BURNS, DOANE, SWECKER & MATHIS, L.L.P.

Date: February 18, 2004

By:

A handwritten signature in black ink, appearing to read 'Patrick C. Keane', is written over a horizontal line.

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